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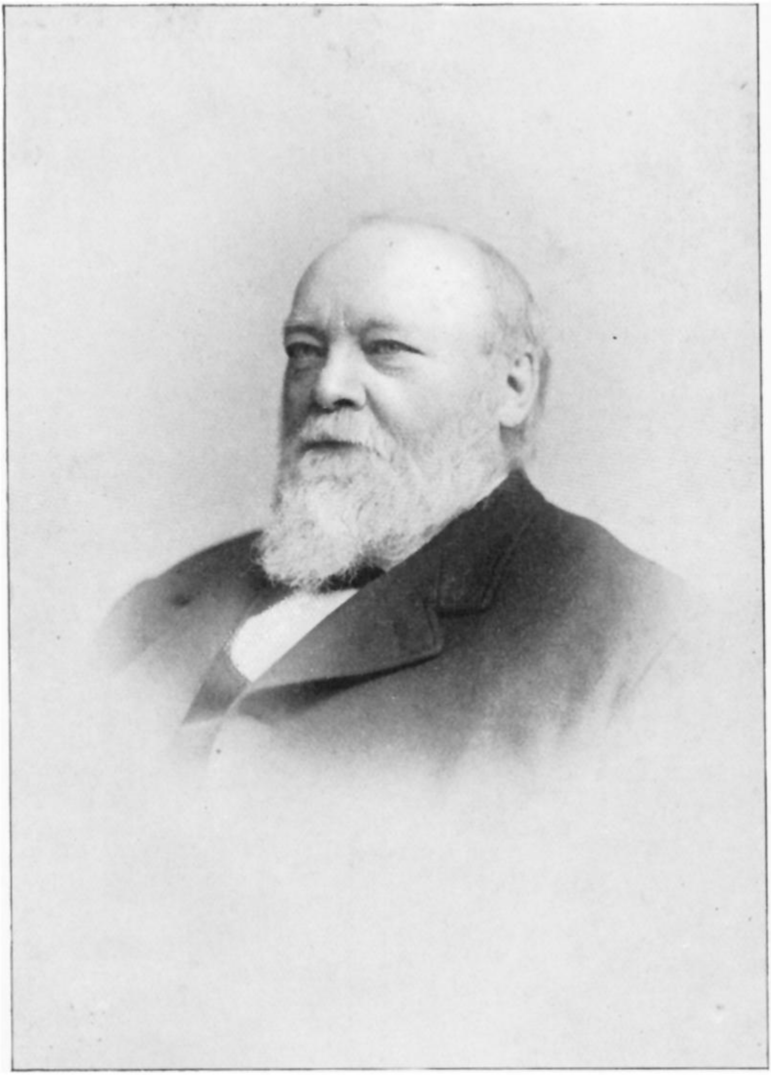
FREDERICK AUGUSTUS GENTH.

(*Read December 6, 1901.*)

One of the sciences in which this country has made itself distinguished, especially upon the chemical side, is the science of mineralogy. In proof of this it is necessary only to mention the names of Dana, of Lawrence Smith, of Sterry Hunt, of Brush, of Shepard, of Cooke and of Genth. Among these eminent men, perhaps none of them devoted himself with more assiduity to this science than did our late colleague, Prof. Dr. Genth.

Friedrich August Ludwig Karl Wilhelm Genth was born in the village of Waechtersbach, in Hesse, on May 17, 1820. On his father's side, his family was an old Hesse-Nassau family, most of whom resided in the vicinity of Wiesbaden. His father was Georg Friedrich Genth, High Forester to Prince Issenbourg, and his mother was Karoline Amalie Genth, her maiden name having been Freyin von Schwarzenau. Her family lived in Darmstadt.

From his earliest days young Genth was taught by his father to take an interest in the phenomena of nature ; whereby his powers of observation became developed and his enthusiasm awakened in the natural sciences, especially in botany, mineralogy and geology. He entered the Hanau Gymnasium at the age of sixteen, this institution being then under the direction of Dr. Schuppius. There he remained for three years, graduating on the 26th of September, 1839, fully prepared for his university course. On the 11th of November following, he matriculated at the University of Heidelberg, and came under the instruction of Gmelin in chemistry, Bischoff in botany, and Blum and Leonhard in geography, geology and mineralogy, these being the sciences to which he had already paid some attention. Owing to the pressure of family matters he left Heidelberg in August, 1841, and in the following November became a student in the University of Giessen, devoting himself mainly to chemistry and studying under Fresenius and Kopp, and particularly of Liebig. Ill health, however, compelled him to leave Giessen in April, 1843. Subsequently, in May, 1844, he entered



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the University of Marburg, studying chemistry under Bunsen and physics under Gerling. In January, 1845, he presented his dissertation to the Faculty and was graduated with the degree of Philosophiæ Doctor. The subject of this thesis was: "Beiträge zur Kenntniss des Kupferschieferhütten-processen, erläutert durch die Untersuchung der auf der Friedrichshütte bei Riechelsdorf gewonnenen Producte." Shortly afterward he became Chemical Assistant to Prof. Bunsen, and was subsequently appointed a Privat-Docent in the University. He held this position for about three years, resigning it in the spring of 1848. In the summer of that year he sailed for Baltimore, and soon after his arrival there he went to Philadelphia, where he established one of the earliest analytical laboratories in America. In the fall of 1849 he received an offer of the position of Superintendent of the Washington (now Silver Hill) mine, in Davidson county, North Carolina. This offer he accepted, giving up his laboratory in Philadelphia and removing in October to Davidson county. Here he remained until August, 1850, when he resigned this position and returned again to Philadelphia, where he reopened his analytical laboratory and devoted himself to research, to commercial analysis and to the instruction of special students in chemistry. It was in this laboratory that the chief part of his admirable work on the ammonia-cobalt bases, as well as the earlier portions of his mineralogical investigations, was done. This work of research attracted general attention, and in 1872, upon the death of Prof. Wetherill, he was tendered the Professorship of Chemistry in the University of Pennsylvania, then just entering upon the new era of prosperity consequent upon its removal to West Philadelphia. This position he at first declined because of the pecuniary sacrifice which it involved; but subsequently he accepted it with the understanding that his private work might still be carried on. He continued to hold his chair, with credit to himself and satisfaction to his colleagues, until the fall of 1888, when he severed his connection with the University and for the third time returned to his private research laboratory and to his professional work.

The earliest scientific paper published by Dr. Genth appeared in *Leonhard and Bronn's Jahrbuch* for 1842. It was entitled "Binnenconchylien lebender Arten im Kalktuff von Ahlersbach," and shows the influence not only of his father's early training in the natural sciences, but also of that of Leonhard, with whom he studied geology in Heidelberg. A second geological paper appeared during the same year with the title "Alter verschiedener Zechsteine;" and in 1848 he published two similar papers in the *Jahrbuch*, entitled respectively "Eocene Schichten mit Beschreibung der Petrifacten" and "Miocene Geognosie des Mainzer Beckens."

It was in Giessen, however, under the influence of Liebig, and particularly in Marburg, where he studied with Bunsen, that Dr. Genth's mind received its strong bias in the direction of chemistry. Even in 1845, before taking his Doctor's degree, he published papers on "Prehnite, a Pseudomorph after Analcime;" on "Chemical Examination of Masopin, a new Gum-resin," and on "The Analysis of Various Refined Coppers." Two manuals by him—one a "Tabular Review of the More Important Reactions of Bases," and the other a similar work on the Acids—appeared soon after his graduation.

The purely chemical papers of Dr. Genth number in all thirty-one. In a letter to Liebig in 1845, and published in the *Annalen*, he called attention to an allotropic modification of nickelous oxide, occurring in the form of small, almost microscopic crystals, grayish-black in color, and having the form of regular octahedrons, on certain disks of refined copper from Riechelsdorf. In 1853 he discovered the corresponding compound of cobalt, which closely resembled it.

In *Liebig's Annalen* for 1848, Dr. Genth published a paper giving analyses of lavas from Hecla, which had been collected by Bunsen during his visit to Iceland. Four of these lavas were examined, those from Thjorsá, Háls and Efrahvolshraun and that of the eruption of 1845. In the first of these he found his first new mineral, which he named Thjorsaite.* The author concludes: (1) That these lavas differ from those of Vesuvius and Etna in that they are insoluble in hydrochloric acid, containing no material gelatinizing with this acid; (2) that the essential constituent in them has the same composition as wichtisite; and (3) that any differences in composition between them are due to the admixture of thjorsaite, chrysolite, orthoclase (?) and magnetite.

In *Erdmann's Journal für praktische Chemie* for 1846 appeared an elaborate paper by Dr. Genth on a "Chemical Examination of the Products obtained in the Metallurgy of Copper Schists." The Friedrichs plant at Riechelsdorf was especially studied and its products were analyzed. This paper covers forty-eight pages and is substantially his inaugural dissertation at Marburg. The immediate occasion of this investigation was the sending to Prof. Bunsen for analysis of various samples of refined copper from Sweden and Norway, together with two samples from the Riechelsdorf works; the whole coming from the Kurfürstliche Ober-berg und Salzwerke-Direction of Cassel. The examination of these coppers was turned over to Dr. Genth, and his paper is divided into six sections. The first describes the processes in use at Riechelsdorf, the second gives the analytical methods used, the third considers the products examined with their physical properties and chemical composition, the fourth gives the analysis of other coppers for comparison, the fifth the same in tabular form and the sixth states some chemico-technological conclusions. The value of this research was recognized by a letter of thanks from the Direction. It resulted in some material changes in the processes employed at the Friedrichs works.

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* Subsequently shown to be Anorthite.

In December, 1852, Dr. Genth read before the Academy of Natural Sciences a paper on a supposed new element which he had detected in certain small white grains associated with iridosmine and platinum from California. On treatment with hydrochloric acid, two of the metallic particles were observed to evolve hydrogen. On removing them from the liquid, they were seen under a magnifier to be mixed with gold. In color they were between tin white and steel, were malleable, but harder than tin and were soluble in nitric acid, yielding a crystalline salt. With hydrogen sulphide the solution gave a brown precipitate. Before the blowpipe on charcoal the metal fused readily, but soon became covered with a black oxide. It gave no incrustation. With borax in the outer flame it dissolved, giving a colorless bead which became opalescent on cooling. Though resembling tin, the new metal is distinguished from it by its complete solubility in nitric acid, by the brown precipitate with hydrogen sulphide and by the absence of a white incrustation before the blowpipe.

The chemical investigation, however, by which Dr. Genth is most widely known is undoubtedly that made on the ammonia-cobalt bases. His original memoir on this subject was published in Philadelphia in 1851 in *Keller and Tiedemann's "Nordamerikanischer Monatsbericht für Natur und Heilkunde,"* under the title "Vorläufige Notiz über Gepaarte Kobalt-Verbindungen." This memoir "contained the first distinct recognition of the existence of perfectly well-defined and crystallized salts of ammonia-cobalt bases." Indeed, it would appear that no trace exists "in any earlier paper of even an idea of the existence of such a class of compounds." The results given in this paper were first obtained in 1847 in Marburg, while the author was chemical assistant to Prof. Bunsen and during the latter's absence in Iceland. They were freely communicated verbally to others and a suite of the salts obtained were deposited at the time in the laboratory at Giessen. In this early memoir Dr. Genth describes two series of salts in which cobalt oxide, conjugated with ammonia, acts as a base. To prepare these bases, ammonium chloride is added to a solution either of cobaltous chloride or sulphate, and the solution is saturated with ammonia. After standing four or five weeks in the air and the excess of ammonia has evaporated, hydrochloric acid is added to acid reaction and the solution is boiled. After some time a crystalline heavy carmine red powder is deposited, consisting of small octahedrons having the empirical formula, $Co_2O_3(NH_4)_3Cl$. Hence they must be considered as the chloride of a paired or conjugated compound, $Co_2O_3(NH_4)_8$, which plays the part of a metal. On further evaporating the mother-liquor from which the carmine red salt was obtained, an orange-yellow cobalt salt separated in crystals. "Though the analyses were from necessity not sufficiently complete and extended to fix the constitution of the bases in question, yet the fact is indisputable that this memoir contained not merely the first announcement of the existence of ammonia-cobalt bases, but also a scarcely less accurate and complete description of two of these bases than any which has since appeared."

The foregoing memoir was called by Dr. Genth a preliminary notice. But inasmuch as circumstances prevented a prompt resumption and continuation of the investigation, the field was entered by others. In 1851 Claudet described purpureocobalt; and later in the same year Frémy communicated to the French Academy "the discovery of a class of compounds containing cobalt and ammonia, and produced by the oxidation of ammoniacal solutions of cobaltous salts," claiming the discovery as his own. He "appears not to have been aware that these two bases had been described in a manner little less complete than his own two years before the appearance of his memoir."

This publication by Dr. Genth interested chemists greatly, and on July 21, 1852, Dr. Wolcott Gibbs, then of New York, who had followed Dr. Genth's directions and had prepared these bases in his laboratory, wrote him as follows: "I enclose you herewith a small quantity of my orange-cobalt compound. . . . Please let me have your opinion of it. I think it identical with yours. Let me urge you to go on with your investigation, as it must lead to very interesting results independently of the beauty of the compounds in question." Dr. Genth's response must have been prompt, for in a second letter, written on the 26th of July, Dr. Gibbs says: "In reply to your proposition I can only say that I will willingly join you in your investigation, provided that on your return to Philadelphia you find that your engagements will prevent you from accomplishing your work alone. You ought, if possible, to have the entire credit which is justly due to you. If, however, you cannot undertake the matter alone, then I will add my labors to yours and we will publish in our joint names." Thus began the association of these two eminent men in the investigation which has since become famous. In the following November Dr. Gibbs himself discovered a new ammonia-cobalt base, obtained by passing nitrogen oxides into solutions of the compounds described by Dr. Genth. Its salts have a dark sherry-wine or brown-yellow color, and the new base differs from the others in the fact that it contains nitrogen dioxide as a coupler in addition to ammonia.

In the joint monograph of Gibbs and Genth, which was published by the Smithsonian Institution in 1856, and afterward printed in the *American Journal of Science*, the nomenclature of Frémy is substantially adopted though somewhat modified. Instead of "Roseocobaltiaque" and "Luteocobaltiaque," as Frémy proposed, the names "Roseocobalt" and "Luteocobalt" are employed for the two bases originally discovered by Dr. Genth; that of "Purpureocobalt" being given to the base discovered by Claudet, "Xanthocobalt" to that discovered by Gibbs, and "Fuscocobalt" to the one described by Frémy. The authors also followed Frémy's example in referring the colors of these substances to the chromatic scale of Chevreul. The crystallographic determinations given in the memoir were made by J. D. Dana. After describing the methods of analysis used, the monograph goes on to state at length the mode of preparation and the properties of the salts of roseocobalt, purpureocobalt, luteocobalt and xanthocobalt, together with the results of their analysis. It concludes with a theoretical discussion of the rational structure of these bases, considering them "as conjugated compounds of sesquioxide, sesquichloride, etc., of cobalt, the five or six equivalents of ammonia, or of ammonia and deutoxide of nitrogen, forming the conjunct, and serving to give to the sesqui-compound of cobalt the degree of stability which it possesses in this class of bodies." This extended and elaborate research has always ranked among the highest chemical investigations ever made in this country. Several years were required to complete it, the analytical portion of the work being as difficult as it was protracted.

In 1858, in conjunction with Dr. Gibbs, Dr. Genth published a preliminary notice of a new base containing osmium and the elements of ammonia; having been led by their previous work to the study of the production of analogous compounds with other metals. On studying the action of the mixed nitrogen oxides upon ammoniacal solutions of the platinum metals, they discovered a well characterized base formed by osmium when thus treated, the salts of which crystallize well. Though noticed by Frémy in 1844, he was mistaken in its constitution, calling it osmiamide. The salts of this new base have a beautiful orange-yellow color, are quite insoluble in cold water, more soluble in hot. Their solutions decompose easily, evolving osmic acid.

Besides the admirable investigations made in pure chemistry, Dr. Genth will ever be remembered for the valuable researches which he made in chemical mineralogy. As early as 1842, while yet a student, he published in *Leonhard and Bronn's Jahrbuch* a paper on "A Pseudomorph of Prehnite after Analcime." And in 1848, there appears in *Liebig's Annalen* a paper by him containing analysis of baulite from Krabla, of phillipsite from Stempel, of chabasite from Annerode, of iron-ochre from the Alta-Birke mine, of speiss-cobalt from Reichelsdorf and of uranite from the Siebengeberge. In 1851, he announced in *Keller and Tiedemann's Monatsbericht* the discovery of tetradymite in North Carolina, of traces of platinum in Lancaster county, Pa., and of a magnetic pyrite in the same locality which contained 2.9 per cent. of nickel and which has since been made the basis of an important nickel industry. The same year he described a mineral from Texas, Pa., which he considered to be a gymnite, in which a portion of the magnesia is replaced by nickelous oxide, isomorphous with it. To this mineral he gave the name nickel-gymnite, but Dana subsequently called it genthite.

A series of highly valuable papers, entitled "Contributions to Mineralogy," were published by Dr. Genth from time to time for several years. These papers were fifty-four in number and contained descriptions of 215 mineral species, in most cases being accompanied by analyses. Most of these contributions appeared in the *American Journal of Science*, although several were published in the *Proceedings of the American Philosophical Society* and in other serials. In a number of his later papers he was aided by S. L. Penfield, who furnished the notes on crystallography. Besides these comprehensive communications, Dr. Genth was the author of twenty-three minor contributions to chemical mineralogy, many of which contained descriptions of new species. He was the discoverer of twenty-four new minerals, all of which were so thoroughly individualized, both by chemical and by physical methods, that they took at once a position in the science which they have ever since maintained.

Dr. Genth was especially distinguished for his extensive knowledge of the chemistry of the rarer elements; and this rendered his analyses of the minerals containing these elements of great value to the science of mineralogy. His papers "On Some American Vanadium Minerals," "On the Vanadates and Iodyrites from Lake Valley, N. M.," "Examination of North Carolina Uranium Minerals," and especially the one "On Some Tellurium and Vanadium Minerals," are noteworthy. In No. VII of his "Contributions to Mineralogy," published in 1868, he gives a list of seven American tellurium minerals, of which two are new species; and in a paper published in 1874 "On American Tellurium and Bismuth Minerals," he describes native tellurium, tetradymite, altaite, hessite, petzite, sylvanite, calaverite, tellurate of copper and lead, bismuthinite and schirmerite, the latter a new mineral. Indeed, he regarded his work on tellurium minerals as among his best efforts. Nearly one-half of the new species made by him were compounds of the rarer elements.

Perhaps the most important, as it certainly was the most extended, of Dr. Genth's mineralogical investigations was that upon "Corundum: Its Alterations and Associated Minerals," the results of which were communicated to the American Philosophical Society in 1873. The paper occupies forty-six pages of the *Proceed-*

ings. In the spring of 1871, he had exhibited to the Society several peculiar crystals of corundum, altered either wholly or partly into other mineral species. "Further chemical investigation of these crystals, and of others similar to them, gave results leading to conclusions which seemed to possess interest not only for the chemist and mineralogist, but in connection with their paragenesis, to the geologist also." The largest deposits of corundum in the world are in a chromiferous serpentine or chrysolite formation and in the rocks adjoining thereto. Localities of this mineral have been developed all the way from Massachusetts to Alabama, and it will always be an interesting question by what agencies such enormous quantities of alumina could have been precipitated to form it. Especially so, since by its subsequent alteration it has given rise to many of the most widely distributed minerals and rocks. The most important deposit of corundum in the East is that at Chester, Mass., discovered by C. T. Jackson, and described mineralogically by C. U. Shepard and J. L. Smith. It consists of crystalline corundum contained in a fine scaly chlorite, and of a peculiar mixture of granular and crystallized corundum and magnetite. By far the largest deposits of corundum, however, occur in North Carolina, the corundum belt stretching southwesterly from Madison county, N. C., through Georgia into Tallapoosa county, Ala., a distance of at least two hundred and fifty miles. The first large mass of corundum was found in 1847 on the French Broad river, near Marshall. It was dark-blue in color and was associated with chlorite and margarite. The outcrop of the Culsagee mine, near Franklin, extends over thirty acres; that of the Cullakenee mine, about twenty miles southwest of this, extends over an area of three hundred acres. The corundum here is generally of a grayish-white or pale ash-gray color, with specks of sapphire occasionally. Sometimes, however, it is of a beautiful pink color, associated with andesite, zoisite, margarite, hornblende, and rarely with chlorite, spinel and tourmaline. Near Gainesville, Ga., corundum exists as a nucleus in irregular kidney-shaped masses of margarite or with a peculiar earthy mineral between isabel and flesh-red in color, intersected at intervals by veins of a fine scaly or massive margarite.

After this general survey of the geological conditions attending the occurrence of corundum, Dr. Genth proceeds to discuss the minerals which are associated with it. Corundum altered into spinel occurs in many localities, the most interesting coming from Hindostan. The corundum crystals are from half an inch to two inches across. Many of them are completely altered, and most of them show that the alteration began at the surface and penetrated irregularly the crystals toward the centre, leaving frequently a nucleus of brownish-gray cleavable corundum. Beauxite, an aluminum hydrate mixed with ferric hydrate and a hydrous aluminum silicate, and enclosing grains of corundum, occurs abundantly in the south of France. T. S. Hunt regarded the corundum as having been produced from the beauxite by loss of its water; but Dr. Genth held the opposite view and maintained that the beauxite has resulted from the hydration of the corundum. Zoisite had been observed in the Urals by Gustav Rose as an associate of corundum. The best locality for it in this country, however, is at the Cullakenee mine, where it occurs sometimes in crystals, but generally in compact and columnar easily cleavable masses, from grayish to greenish and brownish-white in color, many of the specimens showing distinctly that it is the result of the alteration of corundum, the pink corundum being often surrounded by a thin coating of a white zoisite. Tourmaline is associated with corundum at most of the localities above given. At Unionville, Pa., black tourmaline occurs in irregular masses of different sizes, in the corundum itself as well as in the masses resulting from its alteration. Dr. Isaac Lea mentions the occurrence of a crystal of transparent green tourmaline passing through the middle of a prism of diaspore, the whole enveloped by lamellar crystals of pearly emeryllite. At the Culsagee mine there are masses of black tourmaline containing crystals of white and yellowish-white corundum disseminated·through them, the particles of tourmaline crystals being intermixed with the corundum crystals and *vice versa*. Fibrolite has been long known to accompany corundum both in Europe and Asia. The variety used by the Celts in the stone age was obtained in the neighborhood of Chavagnac and Ourouze, in France, where it is associated with mica, cyanite and red and blue corundum. At Norwich, Conn., the small crystals of sapphire are completely surrounded by fibrolite. Cyanite is a very common associate of corundum, rolled masses of it occurring in Litchfield and Washington, Conn., containing corundum and diaspore. An interesting specimen from Newton, Conn., received from G. J. Brush, consists of irregularly arranged bladed masses of a gray, bluish-white and blue cyanite; a yellowish-white micaceous mineral occurring where the blades meet, embedded in which is diaspore containing in immediate contact with the cyanite a rounded fragment of a slightly pink corundum.

The list of these associated minerals includes staurolite, pyrophylite, damourite, ephesite, jefferisite, chlorite, margarite and lazulite, among others; and in the paper are described four new minerals: kerrite, maconite, willcoxite and dudleyite.

The conclusions reached by Dr. Genth as the result of this elaborate investigation are as follows: (1) At the period when the chromiferous and chrysolite beds were deposited a large quantity of alumina was separated and formed beds of corundum; (2) this corundum has subsequently been acted on, and in this way changed into various mineral species—spinel, fibrolite, cyanite, tourmaline, damourite, chlorite and margarite, and, perhaps, also into some varieties of feldspar; (3) a part of the products of the alteration of corundum still exist in the form of large beds of mica and chlorite slates or schists; (4) another part has been still farther altered and converted into other minerals and rocks, such as pyrophyllite, paragonite, beauxite, lazulite, etc.

Dr. Genth gave some attention also to the chemistry of meteorites. In 1854, he described a meteorite from New Mexico, given to him by Prof. Henry, and labeled "native iron." It afforded on analysis: iron, 96.17; nickel, 3.07; cobalt, 0.42, and insoluble matter, 0.57, this latter consisting of iron, nickel and titanium. The following year he published the analysis of a fragment of one of the meteoric irons of Tucson, Mexico, presented to the Academy of Natural Sciences by Dr. Herrmann. This analysis showed the meteorite to consist of iron, copper, cobalt, nickel, chromium, alumina, magnesia, lime, soda, potash, phosphorus and silica, together with a feldspathic mineral, supposed to be labradorite. It agrees substantially with analysis by J. L. Smith of a fragment cut from one of the huge masses in that region by Lieut. John G. Parke, U. S. Engineers. A third meteoric iron was described by Dr. Genth, in 1886, from East Tennessee.

In 1874, Prof. Lesley, Director of the Second Geological Survey of Pennsylvania, appointed Dr. Genth Chemist and Mineralogist of the Survey. His acquaintance with the subject committed to him is well shown by the fact that before the close of that year he presented a "Preliminary Report on the Mineralogy of Pennsylvania," which, together with an "Appendix on Hydrocarbon Compounds," by S. P. Sadtler, covered two hundred and sixty printed pages. The following year he prepared a second "Preliminary Report," covering thirty-one pages. Dr. Genth was also Chemist to the Board of Agriculture of Pennsylvania, and did much by his chemical investigations, and especially by his analysis of fertilizers and other materials, to develop the agricultural industry of the State and to maintain a high standard of excellence in all farm products.

As a man of science Dr. Genth stood among the first in this country. As a chemist, especially in analytical work, he was well-nigh without a peer, being completely familiar not only with the reactions and analytical methods of separation and determination of the ordinary elemental and compound ions, but, what is more remarkable, of the rarer and less frequently occurring ones as well. But this is not all. His scientific work was characterized by a conscientiousness and fidelity to fact which was exceptional. No labor seemed to him too great, if by it an added accuracy could be secured. His knowledge of minerals was complete. Not only did his acute vision aid his early training in recognizing their nature at a glance, but his skill in observing their physical and chemical properties gave him remarkable power in detecting new species. Moreover, his devotion to scientific accuracy was so great that most, if not all, of the differences he had with others involved questions of fact rather than of opinion. Again, his mind had acquired, by long practice, great facility in grasping the relations of structural grouping, both in salts and in minerals, and the rational formula of an ammonia-cobalt base or of a complex mineral species was at once clearly recognized from the empirical results of his analysis.

As a teacher, Dr. Genth was most successful. Apart from his complete command of the subject, he took a great interest in his good students and devoted himself assiduously to their advancement. But for those who were studiously indifferent and careless, to his credit be it said, he had but little regard. He was merciless upon fraudulent work, particularly in analysis. The reputation which he gave to his department in the University was deservedly high. The large amount of research work which he did was never allowed to interfere with his instruction, and those who were his students remained ever afterward among his best friends. His retirement was a great loss to the University, the more so since there is reason to believe that possibly it might have been avoided.

Prof. Dr. Genth was everywhere recognized by his scientific associates as a man of rare talent. He was elected a member of the American Philosophical Society in January, 1854; he was one of the corporate members of the American Chemical Society; was elected a vice-president of this Society in 1876 and president in 1880; in 1872 he was elected a member of the National Academy of Sciences, and in 1875 a Fellow of the American Academy of Arts and Sciences in Boston. The American Association for the Advancement of Science paid him, in 1888, the high compliment of election as one of the three Honorary Fellows of the Association.

Dr. Genth's personality was most agreeable. He was cordial to his friends and associates, valued highly their society and was ever ready to give them any assistance he could render out of the storehouse of his knowledge. He was twice married, first in Europe, in 1847, to Karolina Jaeger, the daughter of the Librarian of the University of Marburg, by whom he had three children—two sons and a daughter—all of whom are yet living. In 1852, he married Minna Paulina Fischer, whom he met in Cumberland, Md.; four daughters and five sons being the issue of this second marriage. Of these four daughters and one son are still living.

Dr. Genth was rather corpulent in his habit, and in his later years went about with some difficulty, being troubled considerably with asthma. He died at his home in Philadelphia on the 2d of February, 1893, from an attack of pneumonia, being in his seventy-third year.

December 6, 1901. GEORGE F. BARKER.